What is claimed is:

1. A modified arginine deiminase for improved manufacturing processes comprising arginine deiminase modified to be free of at least one pegylation site at or adjacent to its catalytic region.

2. The modified arginine deiminase of claim 1 wherein the arginine deiminase is derived from *Mycoplasma hominus*.

3. The modified arginine deiminase of claim 2 wherein the modification comprises the deletion or substitution of at least one amino acid.

4. The modified arginine deiminase of claim 3 wherein the modification comprises at least one amino acid substitution at the 112, 374, 405 or 408 positions.

5. The modified arginine deiminase of claim 4 wherein the modification comprises at least one amino acid substitution selected from the group comprising Lys^{112} to Glu^{112}, Lys^{112} to Val^{112}, Lys^{112} to Asp^{112}, Lys^{112} to Ala^{112}, Lys^{112} to Ile^{112}, Lys^{112} to Leu^{112}, Lys^{374} to Glu^{374}, Lys^{374} to Val^{374}, Lys^{374} to Asp^{374}, Lys^{374} to Ala^{374}, Lys^{374} to Ile^{374}, Lys^{374} to Leu^{374}, Lys^{405} to Glu^{405}, Lys^{405} to Val^{405}, Lys^{405} to Asp^{405}, Lys^{405} to Ala^{405}, Lys^{405} to Ile^{405}, Lys^{405} to Leu^{405}, Lys^{408} to Glu^{408}, Lys^{408} to Val^{408}, Lys^{408} to Asp^{408}, Lys^{408} to Ala^{408}, Lys^{408} to Ile^{408}, Lys^{408} to Leu^{408}, and combinations thereof.

6. The modified arginine deiminase of claim 2 wherein the modification comprises the substitution of lysine at the 112 position.

7. The modified arginine deiminase of claim 6 wherein the modification comprises an amino acid substitution selected from a group comprising Lys^{112} to Glu^{112}, Lys^{112} to Val^{112}, Lys^{112} to Asp^{112}, Lys^{112} to Ala^{112}, Lys^{112} to Ile^{112} and Lys^{112} to Leu^{112}.

8. The modified arginine deiminase of claim 6 wherein the modification comprises the amino acid substitution Lys^{112} to Glu^{112}.

9. The modified arginine deiminase of claim 1 wherein the arginine deiminase is derived from an organism selected from a group comprising *Mycoplasma hominus*, *Mycoplasma pneumoniae*, *Mycoplasma arginini*, *Qiardia intestinalis*, *Clostridium perfringens*, *Bacillus licheniformis*, *Borrelia burgdorferi*, *Borrelia afzellii*, *Enterococcus faecalis*, *Streptococcus pyogenes*, *Steptococcus pneumoniae*, *Lactobacillus sake* and *Qiardia intestinalis*.

10. The modified arginine deiminase of claim 9 wherein the modification comprises the deletion or substitution of at least one amino acid.

11. The modified arginine deiminase of claim 2 further comprising the arginine deiminase having a substitution of proline at the 210 position.

12. The modified arginine deiminase of claim 11 wherein the substitution of proline at the 210 position is selected from the group comprising Pro^{210} to Ser^{210}, Pro^{210} to Thr^{210}, Pro^{210} to Arg^{210}, Pro^{210} to Asn^{210}, Pro^{210} to Gln^{210} and Pro^{210} to Met^{210}.

13. The modified arginine deiminase of claim 11 wherein the substitution of proline at the 210 position is Pro^{210} to Ser^{210}.

14. The modified arginine deiminase of claim 11 wherein the modification comprises the deletion or substitution of at least one amino acid.

15. The modified arginine deiminase of claim 14 wherein the modification comprises at least one amino acid substitution at the 112, 374, 405 or 408 positions.

16. The modified arginine deiminase of claim 15 wherein the modification comprises at least one amino acid substitution selected from the group comprising Lys^{112} to Glu^{112}, Lys^{112} to Val^{112}, Lys^{112} to Asp^{112}, Lys^{112} to Ala^{112}, Lys^{112} to Ile^{112}, Lys^{112} to Leu^{112}, Lys^{374} to Glu^{374}, Lys^{374} to Val^{374}, Lys^{374} to Asp^{374}, Lys^{374} to Ala^{374}, Lys^{374} to Ile^{374}, Lys^{374} to Leu^{374}, Lys^{405} to Glu^{405}, Lys^{405} to Val^{405}, Lys^{405} to Asp^{405}, Lys^{405} to Ala^{405}, Lys^{405} to Ile^{405}, Lys^{405} to Leu^{405}, Lys^{408} to Glu^{408}, Lys^{408} to Val^{408}, Lys^{408} to Asp^{408}, Lys^{408} to Ala^{408}, Lys^{408} to Ile^{408}, Lys^{408} to Leu^{408}, and combinations thereof.

17. The modified arginine deiminase of claim 11 wherein the modification comprises the substitution of lysine at the 112 position.

18. The modified arginine deiminase of claim 17 wherein the modification comprises an amino acid substitution selected from a group comprising Lys^{112} to Glu^{112}, Lys^{112} to Val^{112}, Lys^{112} to Asp^{112}, Lys^{112} to Ala^{112}, Lys^{112} to Ile^{112} and Lys^{112} to Leu^{112}.

19. The modified arginine deiminase of claim 17 wherein the modification comprises the amino acid substitution Lys^{112} to Glu^{112}.

20. An isolated DNA molecule comprising a recombinant coding sequence encoding the modified arginine deiminase of claim 1.

21. A transformed host cell comprising the DNA molecule of claim 20.

22. A recombinant plasmid comprising the DNA molecule of claim 20.

23. A host cell transformed with the recombinant plasmid of claim 22.

24. A composition comprising the modified arginine deiminase of claim 1 covalently bound to polyethylene glycol

25. The composition of claim 24 wherein the modified arginine deiminase is covalently bound via a linking group to polyethylene glycol.

26. A pharmaceutical composition comprising the modified arginine deiminase of claim 24 and a pharmaceutically acceptable carrier or diluent.

27. A method for preparing modified arginine deiminase, comprising:
(a) transforming a host cell with the DNA of claim 20;
(b) growing the transformed host cell in a suitable culture medium;
(c) isolating the modified arginine deiminase.

28. The method of claim 27 further comprising covalently bonding polyethylene glycol to the arginine deiminase.

29. An isolated DNA molecule comprising a recombinant coding sequence encoding the modified arginine deiminase of claim 11.

30. A transformed host cell comprising the DNA molecule of claim 29.

31. A recombinant plasmid comprising the DNA molecule of claim 29.

32. A host cell transformed with the recombinant plasmid of claim 31.

33. A composition comprising the modified arginine deiminase of claim 11 covalently bound to polyethylene glycol.

34. The composition of claim 33 wherein the modified arginine deiminase is covalently bound via a linking group to polyethylene glycol.

35. A pharmaceutical composition comprising the modified arginine deiminase of claim 33 and a biocompatible carrier or diluent.

36. A method for preparing modified arginine deiminase, comprising:
(a) transforming a host cell with the DNA of claim 29;
(b) growing the transformed host cell in a suitable culture medium;
(c) isolating the modified arginine deiminase.

37. The method of claim 36 further comprising covalently bonding polyethylene glycol to the arginine deiminase.

38. A modified arginine deiminase from *Mycoplasma hominus* having a substitution of lysine to glutamic acid at the 112 position and a substitution of proline to serine at the 210 position.

39. An isolated DNA molecule comprising a recombinant coding sequence encoding the modified arginine deiminase of claim 38.

40. A transformed host cell comprising the DNA molecule of claim 39.

41. A recombinant plasmid comprising the DNA molecule of claim 39.

42. A host cell transformed with the recombinant plasmid of claim 41.

43. A composition comprising the modified arginine deiminase of claim 38 covalently bound to polyethylene glycol

44. The composition of claim 43 wherein the modified arginine deiminase is covalently bound via a linking group to polyethylene glycol.

45. A pharmaceutical composition comprising the modified arginine deiminase of claim 38 and a pharmaceutically acceptable carrier or diluent.

46. A method for preparing modified arginine deiminase, comprising:
(a) transforming a host cell with the DNA of claim 39;
(b) growing the transformed host cell in a suitable culture medium;
(c) isolating the modified arginine deiminase.

47. The method of claim 46 further comprising covalently bonding polyethylene glycol to the modified arginine deiminase.

48. An isolated DNA molecule comprising a recombinant coding sequence encoding the modified arginine deiminase of claim 7.

49. A transformed host cell comprising the DNA molecule of claim 48.

50. A recombinant plasmid comprising the DNA molecule of claim 48.

51. A host cell transformed with the recombinant plasmid of claim 50.

52. A composition comprising the modified arginine deiminase of claim 48 covalently bound to polyethylene glycol.

53. The composition of claim 52 wherein the modified arginine deiminase is covalently bound via a linking group to polyethylene glycol.

54. A pharmaceutical composition comprising the modified arginine deiminase of claim 52 and a pharmaceutically acceptable carrier or diluent.

55. A method for preparing the modified arginine deiminase comprising:
(a) transforming a host cell with the DNA molecule of claim 48;
(b) growing said transformed host cell in a suitable culture medium;
(c) isolating the modified arginine deiminase.

56. The method of claim 55 further comprising covalently bonding polyethylene glycol to the modified arginine deiminase.

57. A modified arginine deiminase from *Mycoplasma hominus* having a substitution of proline to serine at the 210 position.

58. An isolated DNA molecule comprising a recombinant coding sequence encoding the modified arginine deiminase of claim 57.

59. A transformed host cell comprising the DNA molecule of claim 58.

60. A recombinant plasmid comprising the DNA molecule of claim 58.

61. A host cell transformed with the recombinant plasmid of claim 60.

62. A composition comprising the modified arginine deiminase of claim 57 covalently bound to polyethylene glycol.

63. The compositions of claim 62 wherein the modified arginine deiminase is covalently bound via a linking group to polyethylene glycol

64. A pharmaceutical composition comprising the modified arginine deiminase of claim 57 and a pharmaceutically accepatable carrier or diluent.

65. A method for preparing the modified arginine deiminase comprising:
(a) transforming a host cell with the DNA molecule of claim 58;
(b) growing said transformed host cell in a suitable culture medium;
(c) isolating the modified arginine deiminase.

66. The method of claim 65 further comprising covalently bonding polyethylene glycol to the modified arginine deiminase.

67. A method of treating a tumor in a patient comprising administering to said patient the composition of claims 24, 26, 33, 35, 43, 45, 52, 54, 62 or 64.

68. A method of treating and inhibiting metastases in a patient comprising administering to said patient the composition of claims 24, 26, 33, 35, 43, 45, 52, 54, 62 or 64.

69. A method of treating parasitic disease in a patient comprising administering to said patient the composition of claims 24, 26, 33, 35, 43, 45, 52, 54, 62 or 64.

70. A method of treating septic shock in a patient comprising administering to said patient the composition of claims 24, 26, 33, 35, 43, 45, 52, 54, 62 or 64.